

Successful Reduction of Mortality by Vaccination against Edema Disease



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Introduction

Oedema Disease is an *Escherichia coli* enterotoxaemia in pigs usually occurring in the first two weeks after weaning, but older pigs can also be affected. In Denmark the disease has been caused by haemolytic F18-positive *E. coli* which produces Shigatoxin Stx2e (verotoxin 2e). Each year 30–50 new cases are diagnosed in Denmark by laboratory examinations. The clinical signs are oedema of the palpebrae and forehead, neurological disorders and sudden death.

The disease can be prevented by the same measures as post weaning diarrhoea i.e. low protein, restricted feeding, zinc oxide, antibiotics etc. However, these measures might reduce the performance of the pigs and cause consumer concern about antibiotic use. The objective of this study was to investigate the safety and efficacy of vaccination with ECOPORC SHIGA in preventing Oedema Disease in weaned piglets.

Material and methods

The study was performed on one Danish commercial farm. It was performed as a masked trial with one vaccine group (257 piglets) and one control group (255 piglets). The piglets were randomly assigned to the two groups equally within litter and either vaccinated with 1 ml when most piglets were four days old or left unvaccinated as controls. The inclusion criteria were: healthy pigs, age >2 days, body weight >800 gram. Antibiotic treatments were allowed only by injection. Vaccinated and non-vaccinated pigs were mingled and housed in the same pens. The pigs were fed ad libitum in the nursery period and 3000 ppm zinc oxide

were included in the starter diet for 14 days to control post weaning diarrhoea. The main response variable was the proportion of pigs that died of post weaning Oedema Disease. All dead piglets were subject to pathological examinations. Secondary parameter was Average Daily Weight Gain in the nursery period and development of antibodies in a subset of vaccinated and control pigs. For the evaluation of safety data on adverse effects and rectal temperature in a subset of pigs before vaccination and 24 hours after vaccination were recorded.

Figure 1 Effect on mortality in nursery period

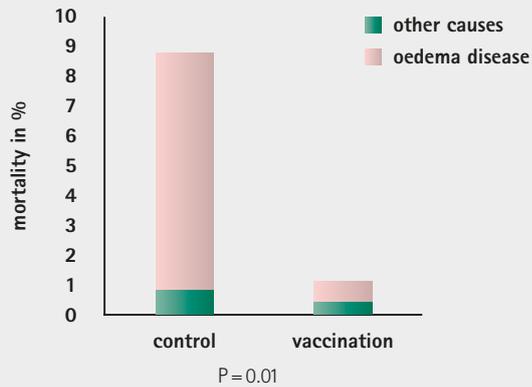
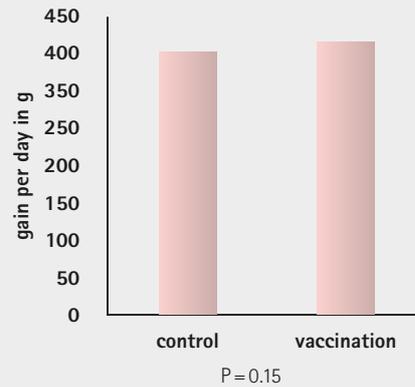


Figure 2 Effect on Average Daily Weight Gain in nursery period



Results

Vaccination reduced the mortality due to Oedema Disease in the nursery from 8% in the control group to 1% in the vaccine group ($p=0.01$). During the nursery period vaccinated piglets gained numerically 16g/day more weight than the control piglets ($p=0.07$). All the vaccinated pigs

and 4% of the control pigs developed neutralising antibodies against Stx2e until the end of the nursery period. No adverse reactions were observed and there were no significant differences in the rectal temperature 24 hours after vaccination between the two treatment groups.

Conclusion

Successful control of Oedema Disease by vaccination can reduce the use of other more problematic preventive measures, e.g. zinc oxide and antibiotics. This study shows that

the new vaccine ECOPORC SHIGA presents an adequate approach towards these aims. ■